Session 3: Data Reconstruction, Interpretation, and Informatics

- Important components of the imaging chain that are post image-data acquisition
- Are computer intense; e.g., speed, storage &/or intelligent transmission
- Their role and complexity are rapidly increasing

Data Reconstruction, Interpretation, and Informatics -- Their role and complexity are rapidly increasing

- Data reconstruction -- examples
  - Technical complexity
    - improved detector systems for multi-slice CT
    - incorporation of 4D data
    - high resolution for animal imaging
  - Clinical role -- more demand for such systems in screening (lung and colon cancer screening); requirement for low dose

Data Reconstruction, Interpretation, and Informatics -- Their role and complexity are rapidly increasing

- **Interpretation -- examples**
  - Increased *recognized need* by user and public for computer-based "interpretations" (recognition of limitations of the human reader)
  - Computer-aided diagnosis (CAD) in screening programs (technically feasible & clinically needed)
  - Quantitative assessment of tumor volume & response to therapy (reduce variability of human)
  - Correlation of quantitative imaging studies to biomarkers (understanding of function)

Data Reconstruction, Interpretation, and Informatics --

Their role and complexity are rapidly increasing

- **Informatics -- examples**
  - **Existence of more "knowledge" about a patient**
  - **Need for real time implementation**

Data Reconstruction, Interpretation, and Informatics

- These areas will continue to grow
- Need to recognize the common areas across disease states in which NIBIB can help and support, e.g.,
  - Methological developments (algorithms)
  - Improved means for validation & diagnostic performance
  - Infrastructure
  - Central repository of databases (e.g., image banks)